



## PRESS RELEASE

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### **Healthy lifestyle lowers risk of Type 2 diabetes by up to 90% in women with gestational diabetes during pregnancy**

***Women with a history of diabetes during pregnancy can still reduce their chances of developing type 2 diabetes by sticking to a healthy lifestyle, such as eating healthily, abstaining from smoking, exercising regularly, and maintaining an optimal weight***

Singapore, 21 September 2022 — Gestational Diabetes Mellitus (GDM), or diabetes during pregnancy, is a common pregnancy complication. Women who developed GDM are nearly 10 times more at risk of developing type 2 diabetes compared to the general population. In particular, Asian women have the highest risk of developing GDM across all the racial and ethnic groups.

In Singapore, up to one in five pregnant women are at risk of GDM. This calls for more public health and research efforts in identifying and developing effective interventions to prevent or delay the progression of type 2 diabetes.

Thus far, the five modifiable risk factors of type 2 diabetes, such as weight control, diet, amount of physical activity, alcohol consumption, and smoking, have been examined individually. However, the combined associations of these risk factors on the long-term risk of developing type 2 diabetes are less well understood, particularly among women who developed GDM.

Professor Zhang Cuijin, faculty member of the Department of Obstetrics and Gynecology at the Yong Loo Lin School of Medicine, National University of Singapore (NUS Medicine), led a team of NUS researchers, in collaboration with National Institutes of Health and Harvard T.H. Chan School of Public Health to delve into examining the associations of adhering to optimal levels of five major modifiable risk factors with the risk of developing type 2 diabetes among women with a history of GDM.

In addition, they examined the associations among these high-risk women who were further predisposed by a greater genetic susceptibility and were overweight (BMI > 25.0 kg/m<sup>2</sup>). This group of women may have considered developing diabetes as unavoidable.

The study, published in the British Medical Journal (BMJ), showed promising findings on the beneficial roles of optimal modifiable factors in lowering type 2 diabetes risk among these high-risk women.

“Major findings from the study convey a hopeful and powerful message to women at exceptionally high risk, and women with a history of GDM. Even though these women have a

much greater risk of type 2 diabetes, adopting a healthy diet and lifestyle can lower up to 90% risk of type 2 diabetes and even alleviate the high genetic risk of type 2 diabetes. Those who are overweight may also benefit from adopting these healthful lifestyle practices after their GDM-complicated pregnancy,” said Prof Zhang.

The study population consisted of 4,275 women with a history of GDM from the Nurses’ Health Study II, a longitudinal predominantly white female cohort in the United States that has been followed up since 1989. These participants were included as part of the Diabetes & Women’s Health Study initiated and led by Prof Zhang for investigating modifiable and genetic risk factors for type 2 diabetes and comorbidities following pregnancies complicated by GDM.

In the study, 924 women developed type 2 diabetes over 28 years of follow-up. After adjusting for other major diabetes risk factors, the researchers found that having optimal levels of the five modifiable risk factors, namely a normal BMI (18.5-24.9), high-quality diet, regular exercise, abstinence from smoking, and moderate alcohol consumption, was associated with a relative reduction of more than 90% in the risk of type 2 diabetes, compared to those who did not have any. Each additional optimal modifiable factor was associated with an incrementally lower risk of the disorder.

To highlight, the beneficial dose-response associations were consistently seen, even among women with obesity and among women with greater genetic susceptibility to type 2 diabetes.

Together, these findings convey hopeful messages to those women who have a greater underlying susceptibility to type 2 diabetes by encouraging them to adopt healthful lifestyle practices, namely eating healthily, exercising regularly, not smoking, and maintaining an optimal body weight on lowering the risk of future type 2 diabetes, ideally soon after the development of GDM.

The first author of the study, Dr Jiayi Yang, a research fellow in the Global Centre for Asian Women’s Health and Department of Obstetrics and Gynecology at NUS Medicine, commented, “Although causal relationships cannot be established given the observational nature of the study, ample evidence consistently support the effectiveness of healthy lifestyles in preventing obesity or type 2 diabetes, and on improving cardiometabolic health among diverse populations.”

In view of the alarmingly high prevalence of GDM in Asia broadly and in Singapore particularly, and the ongoing diabetes epidemic in Asia, future studies among high-risk Asian women are warranted to further expand findings from the study.

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Our multidisciplinary and real-world approach to education, research and entrepreneurship enables us to work closely with industry, governments and academia to address crucial and complex issues relevant to Asia and the world. Researchers in our faculties, 30 university-level research institutes, research centres of excellence and corporate labs focus on themes that include energy; environmental and urban sustainability; treatment and prevention of diseases; active ageing; advanced materials; risk management and resilience of financial systems; Asian studies; and Smart Nation capabilities such as artificial intelligence, data science, operations research and cybersecurity.

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Through a dynamic and future-oriented five-year curriculum that is inter-disciplinary and inter-professional in nature, our students undergo a holistic learning experience that exposes them to multiple facets of healthcare and prepares them to become visionary leaders and compassionate doctors and nurses of tomorrow. Since the School's founding in 1905, more than 12,000 graduates have passed through our doors.

In our pursuit of health for all, our strategic research programmes focus on innovative, cutting-edge biomedical research with collaborators around the world to deliver high impact solutions to benefit human lives.

The School is the oldest institution of higher learning in the National University of Singapore and a founding institutional member of the National University Health System. It is one of Asia's leading medical schools and ranks among the best in the world (Times Higher Education World University Rankings 2022 by subject and the Quacquarelli Symonds (QS) World University Rankings by subject 2022).

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